



# HMUN 2025

**Discussing a worldwide framework for child vaccines**

**UNICEF**

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**Issue:** Discussing a worldwide framework for child vaccines

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## Introduction

The topic of child vaccines has been big in the news lately regarding the monkeypox in parts of Africa. In Western countries, child vaccines might even be seen as normal nowadays, some countries even mandatory. Ranging from vaccines for newborn babies to adolescent women against cervical cancer to the elderly getting flu shots regularly. Some parents question the effectiveness of vaccines or safeness, some of this comes from social media and the fake stories going around on there. Due to this, it has been seen as a touchy topic recently, but nonetheless an important one. With the number of children dying declining, it is important to keep that up. For example, the measles vaccine by itself has prevented over 21 million deaths between 2000 and 2017.

## Definition of Key Terms

### Efficacy rate

Efficacy rate refers to the percentage by which a vaccine or treatment reduces the risk of a disease in a clinical trial or controlled setting compared to a group that was not exposed to the vaccine or treatment. It measures how well the vaccine works to prevent disease in a population under ideal conditions.

### Eradication

Eradication refers to the complete and permanent removal of a disease or condition from a specific area or even the entire world. When a disease is eradicated, it means that it no longer exists anywhere in the natural environment, and there is no longer any need for further control measures or vaccinations.

### Herd Immunity

A form of indirect protection from infectious diseases that occurs when a large percentage of a population becomes immune, making it less likely for the disease to spread.

## Immunization

The process of making a person (or child) immune or resistant to an infectious disease, typically through vaccination.

## Pathogens

Pathogens are microorganisms or agents that can cause disease in a host organism. They include various types of harmful entities that invade the body and disrupt normal biological functions. Pathogens can cause a wide range of illnesses, from mild infections to severe diseases.

## Vaccine Equity

The principle is that all children, regardless of their location, socioeconomic status, or nationality, should have equal access to vaccines.

## General Overview

### History of child vaccines

1000 CE, smallpox was the deadliest child disease. Centuries later, Edward Jenner created the first vaccine against this sickness. He took a bit of cowpox from a milkmaid's hand and inoculated the little eight-year-old boy James Phibbs with this. Even though he did become sick for a bit and had a local reaction, little James made a full recovery. Two months later, Jenner again inoculated Phibbs with the matter of human smallpox; this was to test the resistance. The boy stayed in perfect healthy shape and thus became the first person ever to be vaccinated. After this, the word vaccine came to be from the Latin word for cow: Vacca. And with this, the history of vaccines started. In 1972, smallpox was officially eradicated and is no longer a recommended vaccine.

Over the centuries, many vaccines have been created, protecting people from all sorts of diseases. With the help of vaccines, many sicknesses have been eradicated. Today, vaccines prevent between 3.5 million and 5 million deaths every year, with vaccines for 20 life-threatening diseases. The way it works is that a bit of weakened or ineffective parts of a disease are taken and put into the body, this way, your immune system must start working and fight to kill that little matter. When you again get infected by that sickness, your body "remembers" how to fight it and takes immediate action. You do not get sick this time and are thus immune to this disease.

In 2019, an estimated 5.2 children and infants under the age of five passed away from diseases that could've been prevented. Children aged 1 to 11 months made up for 1.5 million of these deaths, while children aged 1 to 4 years accounted for 1.3 million deaths. Newborns (under four weeks) presented the remaining 2.4 million deaths. About half a million children over the age of five till the age of nine passed away in 2019. A lot of these deaths would not have happened if these children had been vaccinated or had been able to access the right health care and medicine.

### **The Mechanisms Behind Vaccination**

Vaccines stimulate the immune system to recognize and fight specific pathogens such as viruses, bacteria, fungi, and protozoa. Without such vaccines, the body must swiftly react to the foreign pathogens. With a lack of data on the foreign pathogen, the body attempts to fight the disease by creating cures on the spot. In other words, without vaccines, the body would have to rely on its natural immune response to fight off these foreign invaders. During this time, the body may not react quickly enough, and the illness may progress before an effective defense is mounted. Furthermore, the body expends a significant amount of energy to fight off diseases, which can result in the host experiencing various side effects, such as fatigue, fever, muscle aches, and inflammation.

Vaccines, on the other hand, enhance the body's ability to respond rapidly and effectively. They typically introduce a small, harmless dose of the pathogen's genetic material or an inactivated version of the pathogen into the body. This primes the immune system by familiarizing it with the pathogen, enabling it to quickly recognize and neutralize the invader if encountered in the future.

### **Safeguarding At-Risk Populations**

On the surface, it may seem that getting vaccinated is solely for one's personal benefit. However, vaccination is also a critical step toward achieving herd immunity, a state in which a significant portion of the population is immunized, thereby reducing the spread of disease within the community. When individuals are vaccinated, they are not only less likely to contract the disease themselves, but they are also less likely to transmit it to others. This is particularly important for protecting vulnerable groups who cannot receive vaccines due to factors such as age, pregnancy, or immunocompromised conditions. These individuals rely on the immunity of others to help shield them from potentially life-threatening illnesses.

Thus, vaccination extends beyond individual protection; it is a collective responsibility that safeguards those who are most at risk. By increasing vaccination rates, we ensure that vulnerable populations are less likely to be exposed to dangerous pathogens, contributing to the overall health and resilience of the community.

## Controlling and Eradicating Diseases

Controlling and eradicating diseases is a monumental task that requires global cooperation and concerted efforts across multiple sectors. While vaccinations play a pivotal role in controlling the spread of infectious diseases, the ultimate goal is to completely eradicate certain diseases from the planet, as has been achieved with smallpox.

When diseases are controlled, their transmission is significantly reduced, and public health systems can manage cases more effectively. Eradication, however, goes a step further, aiming for the total elimination of a disease from a specific geographic area or even worldwide. This not only protects individuals but also removes the burden of such diseases on society, freeing up resources that can be better used for other public health priorities.

Once diseases are controlled and eradicated, valuable resources could be used elsewhere. The success of these efforts benefits not only those directly involved but also the broader global community, creating a safer, healthier world for future generations.

## Vaccine Approval and Efficacy

For a vaccine to be approved by the WHO (World Health Organisation), the vaccine must have an efficacy rate higher than 50%. Such a threshold ensures that vaccines provide a substantial benefit in preventing disease, even though the level of protection may vary depending on the specific vaccine and individual response.

## The Statistics of Child Vaccination Currently

Although coverage varies greatly by region, nearly 85% of children worldwide had standard vaccinations in 2021. While regions like Sub-Saharan Africa and South Asia experience difficulties, with some nations barely reaching 80% coverage, high-income countries generally attain immunization rates over 95%.

Every year, almost 20 million children (around the population of New York) remain lacking in being fully immunized, leaving them at risk for illnesses. Outbreaks of measles draw attention to coverage gaps, which are frequently caused by vaccine reluctance and limited access in underserved regions. Even though the number of polio cases has decreased by more than 99 percent, cases are

still reported in nations like Afghanistan and Pakistan, demonstrating how challenging it is to reach children in conflict areas. To guarantee the safety of every child, ongoing efforts are necessary.

## Globally

The issue differs in every country or region. For example, in more Western countries such as the Netherlands, a lot of diseases are no longer active, such as monkeypox or pox, which has recently been in the news again regarding the rise in African regions. In these Western countries, child mortality due to diseases is significantly lower. The region with the highest numbers of this is the sub-Saharan region. 1 in every 13 children die before they reach their fifth birthday. This makes this region twenty years behind the global average, which achieved 1 in 13 in 1999. The sub-Saharan African region, together with southern Asia, accounts for eighty percent of the earlier number mentioned of the estimated 5.2 children under the age of five passing away in 2019.

## Timeline of Key Events

- |                                       |   |
|---------------------------------------|---|
| <b>1796</b>                           | The first vaccine was created by Edward Jenner. He used cowpox to create immunity against smallpox. He tested it on an eight-year-old boy. Edward Jenner was due to this finding, called the father of vaccines, even though he was not the first person to start experimenting with the concept of post-exposure immunisation. |
| <b>End of 19<sup>th</sup> century</b> | Most children attending public schools were required to be vaccinated against smallpox in the United States of America.   |
| <b>1885</b>                           | Louis Pasteur successfully prevented rabies because of post-exposure vaccination. However, this method is controversial due to the fact that it was unsuccessfully used twice before on humans. And the method of injecting humans with a disease matter is still quite new and an uncertain practice.                          |
| <b>1918-1919</b>                      | The outbreak of the Spanish flu, killing between 20-50 million people worldwide and including 1 in 67 United States soldiers. Making a vaccine for this became a U.S. military priority.  |

- 1937** Max Theiler, Eugen Haagen, and Hugh Smith created the 17D vaccination to prevent yellow fever. More than a million people received the vaccination in 1938 when it was approved. Theiler later receives the Nobel Prize.
- 1948** The World Health Organization was founded.
- 1952-1955** The first effective polio vaccine is created by Jonas Stalk. He first starts his trials by testing it on himself and his family.
- 1954** A mass trial on 1.3 million children began to test the Polio vaccine created by Stalk.
- 1960** A second kind of polio vaccine that Albert Sabin created has been authorized for use. Sabin's vaccine was administered orally, as drops, or on a sugar cube. It was live-attenuated, meaning it used a weakened version of the virus. The Soviet Union and Eastern Europe were the first to test and produce the oral polio vaccine (OPV). The world's first nation to eradicate polio is Czechoslovakia.
- 1971** The measles vaccine created in 1963 is combined with recently developed vaccines against mumps (1967) and rubella (1969) into one singular vaccination that will be named the abbreviation of the three vaccines. (MMR) by Dr Maurice Hilleman.
- 1974** To create immunization programs globally, WHO launched the Expanded Programme on Immunisation (EPI), which is now known as the Essential Programme on Immunisation. Measles, polio, tetanus, whooping cough, TB, and diphtheria are the initial illnesses that the EPI first targets.
- 1980** The World Health Assembly, acting on the recommendation of the World Health Organization, officially declared smallpox eradicated.
- 2020** Outbreak of the Covid-19 pandemic, affecting millions of children.

## Major Parties Involved

### WHO (World Health Organization)

The World Health Organization, or the usual abbreviation WHO, plays a major part in child vaccines. WHO is the United Nations agency that focuses on connecting nations to promote global health. WHO is in charge of international initiatives to increase universal health coverage. They oversee and plan the global response to medical crises. Additionally, this organization advocates for healthier lifestyles from prenatal care to old age. With the help of science-based policies and initiatives, their Triple Billion targets set out an ambitious strategy for the whole world to attain universally good health. They work with 194 member states across six regions with over 150 locations. One of their focuses is improving children's healthcare and lowering the annual number of deaths.

### Gavi, the Vaccine Alliance

Gavi was founded in 2000, after the acute market failures during the late 1990s due to powerful new vaccines becoming available. In response, the Bill and Melinda Gates Foundation, together with a group of founding partners, brought to life a solution that encourages manufacturers to lower the prices for vaccines in Less economically developed countries in return for a high volume and predictable demand from those said countries. That idea became the Have, the Vaccine Alliance. This organization is now responsible for vaccinating half of the children all over the world. With 19 manufacturers working together with Gavi in 2022, which has grown with 14 companies since 2001, they can negotiate prices that work better for poorer countries and remove the commercial risk that used to keep producers from serving them.

### UNICEF (United Nations Children's Fund)

UNICEF, the United Nations Children's Fund, plays a pivotal role in child vaccination efforts globally. As a leading international organization dedicated to promoting and protecting the rights of children, UNICEF works to ensure that every child receives life-saving vaccines. It operates in over 190 countries, providing access to vaccines and strengthening healthcare systems, particularly in regions with limited resources. UNICEF collaborates with governments, global partners, and local communities to deliver vaccines to vulnerable populations, especially in emergency and conflict



situations. In an effort to lower avoidable young mortality, the organization also plays a significant role in overcoming obstacles, including vaccine reluctance and increasing public understanding of the value of vaccination.

## Possible Solutions

To guarantee that every child gets the vaccinations they require, the objective is to increase immunization coverage and monitoring. Using technology like smartphone apps and online databases, governments, health organizations, and communities can improve data gathering and tracking systems to track vaccination rates and pinpoint low-coverage areas. For instance, including vaccination tracking in standard medical services, such as prenatal, maternity, and pediatric care, enables medical professionals to provide vaccinations in addition to other necessary treatments. It will be simpler to respond to outbreaks and raise vaccination rates overall if health systems are strengthened with improved monitoring technologies and if vaccinations are included in routine medical appointments.

It is crucial to promote the development of new vaccines in order to shield children from diseases that can be prevented. To invest in research to develop vaccines for diseases like malaria, pneumonia, and other children's ailments, governments, international health organizations, and the corporate sector can work together. Partnerships, for instance, can expedite the creation of novel vaccination platforms, such as mRNA technology, to address a variety of illnesses. Children will be better protected from current and emerging health hazards thanks to investments in research and innovation, which will produce more effective vaccines.

Prioritizing equity and inclusion is necessary to guarantee that all children have access to life-saving vaccinations. Vaccination campaigns in vulnerable places, like rural areas, conflict zones, and refugee camps, must be given top priority by governments, health organizations, and local people. Focused outreach initiatives can guarantee that no child is left behind and address issues these communities face. Vaccination programs may guarantee that all children, regardless of their background, receive the protection they need by concentrating on the needs of underserved and marginalized communities.

## Further Reading

*A brief history of vaccination.* (2024, December 13). <https://www.who.int/news-room/spotlight/history-of-vaccination/a-brief-history-of-vaccination>

When researching and wanting to understand the history of the topic of vaccines better, the site of the World Health Organization creates a good overview of this. If wanting to know more on the topic of children's health in general, look at their site under the tap of health issues.

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